

CLAIMS

1. A method of performing electrochromatography, the method comprising the steps of:

5 urging a die block toward a stationary phase supported on a sample plate so as to exert a pressure which is greater than atmospheric pressure against the stationary phase, and

creating an electrical potential across the stationary phase with a first electrode and a second electrode so as to cause a liquid mobile phase to be advanced across the stationary phase.

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2. The method of claim 1, further comprising the step of placing the stationary phase in contact with the liquid mobile phase prior to the creating step.

3. The method of claim 1, wherein the urging step comprises urging a
15 metal die block toward the stationary phase supported on the sample plate.

4. The method of claim 1, further comprising the step of positioning the sample plate in a plate holder prior to the urging step.

20 5. The method of claim 1, wherein the urging step comprises urging the die block with a fluid ram.

6. The method of claim 1, wherein the urging step comprises urging the die block with a hydraulic ram.

7. The method of claim 1, further comprising the step of positioning a cover slip over the sample plate prior to the urging step.
8. The method of claim 1, wherein the urging step comprises urging
5 the die block into contact with the sample plate.
9. The method of claim 1, wherein:
the stationary phase is supported on a first side of the sample plate, and
the urging step comprises urging the die block into the first side of the
10 sample plate.
10. An apparatus for performing electrochromatography, the apparatus comprising:
a plate holder configured to support a sample plate, and
15 a die block, at least one of the die block and the plate holder being movable relative to the other so as to exert a force which is greater than atmospheric pressure on the sample plate when the sample plate is positioned in the plate holder.
11. The apparatus of claim 10, further comprising a fluid ram operable
20 to move the first die block relative to the plate holder.
12. The apparatus of claim 11, wherein the fluid ram comprises a hydraulic ram.

13. The apparatus of claim 10, further comprising a stationary compression surface, wherein the plate holder is interposed between the die block and the stationary compression surface.

5 14. The apparatus of claim 10, wherein the plate holder comprises a first frame member and a second frame member, the sample plate being sandwiched between the first frame member and the second frame member when the sample plate is positioned in the plate holder.

10 15. The apparatus of claim 14, further comprising a cover slip, wherein the cover slip is sandwiched between the first frame member and the sample plate when the sample plate is positioned in the plate holder.

15 16. The apparatus of claim 10, further comprising a first electrode and a second electrode configured to create an electrical potential across the sample plate when the sample plate is positioned in the plate holder.

20 17. The apparatus of claim 10, further comprising a fluid reservoir, wherein a first portion of the sample plate is positioned in the fluid reservoir when the sample plate is positioned in the plate holder.

25 18. The apparatus of claim 17, further comprising a first electrode and a second electrode configured to create an electrical potential across the sample plate when the sample plate is positioned in the plate holder, wherein the first electrode is positioned in the fluid reservoir.

19. The apparatus of claim 18, wherein a second portion of the sample plate is electrically coupled to the second electrode.
20. An apparatus for performing electrochromatography, the apparatus
5 comprising:
a plate holder configured to support a sample plate,
a first die block, and
a second die block, the first die block and the second die block being
movable relative to one another so as to exert a force which is greater than
10 atmospheric pressure on the sample plate when the sample plate is positioned in the
plate holder.
21. The apparatus of claim 20, wherein the plate holder is interposed
between the first die block and the second die block.
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22. The apparatus of claim 20, further comprising a fluid ram operable
to move the first die block relative to the second die block.
23. The apparatus of claim 22, wherein the fluid ram comprises a
20 hydraulic ram.
24. The apparatus of claim 20, wherein the plate holder comprises a
first frame member and a second frame member, the sample plate being sandwiched
between the first frame member and the second frame member when the sample plate
25 is positioned in the plate holder.

25. The apparatus of claim 24, further comprising a cover slip, wherein the cover slip is sandwiched between the first frame member and the sample plate when the sample plate is positioned in the plate holder.

5 26. The apparatus of claim 20, further comprising a first electrode and a second electrode configured to create an electrical potential across the sample plate when the sample plate is positioned in the plate holder.

10 27. The apparatus of claim 20, further comprising a fluid reservoir, wherein a first portion of the sample plate is positioned in the fluid reservoir when the sample plate is positioned in the plate holder.

15 28. The apparatus of claim 27, further comprising a first electrode and a second electrode configured to create an electrical potential across the sample plate when the sample plate is positioned in the plate holder, wherein the first electrode is positioned in the fluid reservoir.

29. The apparatus of claim 28, wherein a second portion of the sample plate is electrically coupled to the second electrode.

30. An apparatus for performing electrochromatography, the apparatus comprising:

a plate holder configured to support a sample plate,
a die block, at least one of the die block and the plate holder being
5 movable relative to the other so as to exert a force which is greater than atmospheric pressure on the sample plate when the sample plate is positioned in the plate holder, and

a thermally conducting, electrically insulating sheet positioned between the die block and the plate holder.

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31. The apparatus of claim 30, wherein the thermally conducting, electrically insulating sheet comprises an aluminum nitride ceramic sheet.

32. The apparatus of claim 30, wherein the thermally conducting,
15 electrically insulating sheet is secured to the die block.

33. The apparatus of claim 30, further comprising a cover slip, wherein the cover slip is positioned between the thermally conducting, electrically insulating sheet and the sample plate.

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34. The method of claim 1, further comprising the step of advancing a fluid through a number of fluid channels defined in the die block.

35. The apparatus of claim 10, wherein the die block has a number of
25 fluid channels defined therein.

36. The apparatus of claim 20, wherein at least one of the first die block and the second die block has a number of fluid channels defined therein.

37. The apparatus of claim 30, wherein the die block has a number of
5 fluid channels defined therein.

38. An apparatus for performing electrochromatography, the apparatus comprising:

a sample plate, and

10 a die block, at least one of the die block and the sample plate being movable relative to the other so as to exert a force which is greater than atmospheric pressure on the sample plate.

39. The apparatus of claim 38, further comprising a fluid ram operable
15 to move the first die block relative to the sample plate.

40. The apparatus of claim 39, wherein the fluid ram comprises a hydraulic ram.

20 41. The apparatus of claim 38, further comprising a stationary compression surface, wherein the sample plate is interposed between the die block and the stationary compression surface.

25 42. The apparatus of claim 38, further comprising a cover slip, wherein the cover slip is positioned between the sample plate and the die block.

43. The apparatus of claim 38, further comprising a first electrode and a second electrode configured to create an electrical potential across the sample plate.

44. The apparatus of claim 38, further comprising a fluid reservoir,
5 wherein a first portion of the sample plate is positioned in the fluid reservoir.

45. The apparatus of claim 44, further comprising a first electrode and a second electrode configured to create an electrical potential across the sample plate, wherein the first electrode is positioned in the fluid reservoir.

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46. The apparatus of claim 45, wherein a second portion of the sample plate is electrically coupled to the second electrode.

47. The apparatus of claim 38, further comprising a thermally
15 conducting, electrically insulating sheet positioned between the die block and the sample plate.